Reduction of Defects in Germanium Silicon (RDGS)

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NASA Objectives and Contributions:

- Partially detached crystals can be grown on Earth
- Test the theory that solidification free of wall contact reduces defect density.
- Evaluate competing theories for the production of critical materials by testing different growth configurations and using the space environment

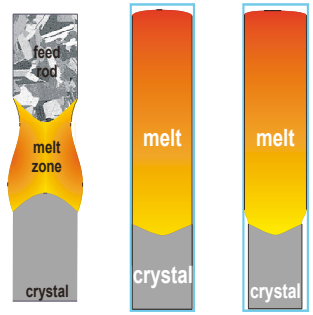
Relevance/Impact:

- Defects in semiconductors propagate into the final electronic devices thereby reducing their performance
- Ideal is a breakthrough in understanding and control of detached terrestrial growth in many materials of technological and commercial interest.

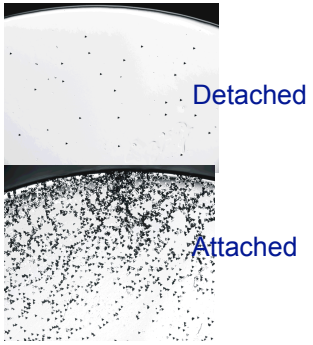
Development Approach:

- NASA will concentrate on Bridgman growth, with the German team working on float zone.
- German teams will make use of free flyers (FOTON)
- Flight experiments will be done in LGF/MSL/MSRR

Ground-based Research



Float Zone | Attached Solidification | Detached Solidification



Etch Pits

ISS Resource Requirements

Accommodation (carrier)	LGF within MSRR
Upmass (kg) (w/o packing factor)	0.01 for samples 2 for SACAs
Volume (m^3) (w/o packing factor)	10e-8 for samples 0.005 for SACAs
Power (kw) (peak)	TBD
Crew Time (hrs) (installation/operations)	4
Autonomous Operation	TBD
Launch/Increment	TBD

Project Life Cycle Schedule

Milestones	SCR	RDR	PDR	CDR	VRR	Safety	FHA	Launch	Ops	Return	Final Report
Actual/ Baseline	12/00							12/11			